

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 5946 (1992): Meteorology - Whirling psychrometer [PGD
21: Meteorological Instruments]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक

मौसम विज्ञान – आवर्ती आर्द्रतामापी – विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

METEOROLOGY — WHIRLING
PSYCHROMETER — SPECIFICATION

(*First Revision*)

UDC 551.508.71

© BIS 1992

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1992

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Meteorological Instruments Sectional Committee had been approved by the Light Mechanical Division Council.

The accurate measurement of atmospheric humidity is of great importance in meteorological practice. The most common method of measuring humidity is by the use of a psychrometer which consists essentially of two similar thermometers exposed side by side, one of which is an ordinary thermometer known as the dry-bulb thermometer and the other with its bulb covered with a piece of thin wet material called the wet-bulb thermometer. The temperature indicated by the wet bulb is generally lower than that of the dry bulb because of evaporation of water from the wet bulb. The humidity of the air is calculated from the readings of the dry and wet bulb thermometers, using appropriate psychrometric tables.

The psychrometers are either of the stationary screen type or of the portable whirling type. The latter are more accurate since the depression of the wet bulb reading below the dry bulb reading depends on the speed of the air past the bulbs when the wind speed is low. In the whirling psychrometer, the required flow of air past the bulbs is provided by whirling the psychrometer rapidly by hand at the rate of about 3 to 4 rev/s to give an air speed of at least 4 m/s past the bulbs.

This standard was originally published in 1970. This revision is based on further experience gained in the manufacture of meteorological instruments and other development in this field.

Main modifications are:

- a) Moulded plastic frame for whirling psychrometer has been incorporated.
- b) In view of (a) above 3.1, 3.2, 5.1 and 8.1 have been modified.

In the formulation of this standard, due consideration has been given to the requirements laid down by the World Meteorological Organization, Geneva.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

METEOROLOGY — WHIRLING PSYCHROMETER — SPECIFICATION

(*First Revision*)

1 SCOPE

1.1 This standard specifies the requirements for whirling psychrometer for measuring air temperature and atmospheric humidity.

2 REFERENCES

IS 6017 : 1971 'Thermometer for whirling psychrometers' is a necessary adjunct to this standard.

3 DESCRIPTION

3.1 The thermometers are mounted side by side in a wooden frame or a moulded plastic frame provided with a handle. The handle is fixed to the frame in such a manner that the instrument may be rotated smoothly at about 3 to 4 rev/s to have an air speed of at least 4 m/s past the bulbs.

3.2 One of the thermometers has its bulb covered with a single layer of thin cotton fabric which has to be wetted with distilled water just before an observation is made. In the moulded plastic frame a small water can is provided (*see Fig. 3*) and the cotton sleeving dips in the water in the can thereby always keeping it moist.

4 DIMENSIONS

4.1 The dimensions of the whirling psychrometer shall be as given in Fig. 1, 2 and 3.

4.1.1 Tolerances

Tolerance or dimensions up to and including 30 mm shall be ± 1 mm and on dimensions above 30 mm shall be ± 2 mm.

5 GENERAL REQUIREMENTS

5.1 Frame

The psychrometer frame shall be made of soft wood or moulded plastic such as polyvinylidene chloride or polyvinyl chloride and the handle of wood or any other suitable material (*see Fig. 1 and 2*). It shall be so shaped as to give a good grip and shall be so fixed that when the spindle is held vertically, the frame slopes

down at an angle of about 15° to the horizontal. A handle fixed at right angles to the frame is also permitted (*see Fig. 3*). The thermometers shall be fixed in the frame and held in position by suitable packing material below the metal frame.

5.1.1 The wooden frame shall be finely polished and given two coats of clear cellulose lacquer. All the metal parts shall be chromium plated and polished.

5.2 Thermometers

The thermometers for use with whirling psychrometer shall conform to IS 6017 : 1971.

5.3 Cotton Fabric and Thread

The sleeve for the wet bulb shall be either woven cylindrical cotton sleeve or sewn from very closely woven cotton fabric leaving as little in the seam as possible. It shall be a tight fit when slipped over the bulb, and the top and the lower ends shall be tied above and below the bulb with thread. Both the fabric and the thread shall be clean and water absorbent.

6 WORKMANSHIP AND FINISH

6.1 The thermometers shall be so fitted that the two bulbs are symmetrical in the slots of the frame. The centres of the bulbs shall be approximately in the centres of the slots.

6.2 All the moving parts of the psychrometer shall fit smoothly and the handle so shaped that the instrument may be conveniently rotated at the require speed.

7 TESTING AND INSPECTION

7.1 All the psychrometers belonging to the same consignment shall constitute a lot.

7.2 All the thermometers shall be tested individually for all the requirements prescribed in IS 6017 : 1971.

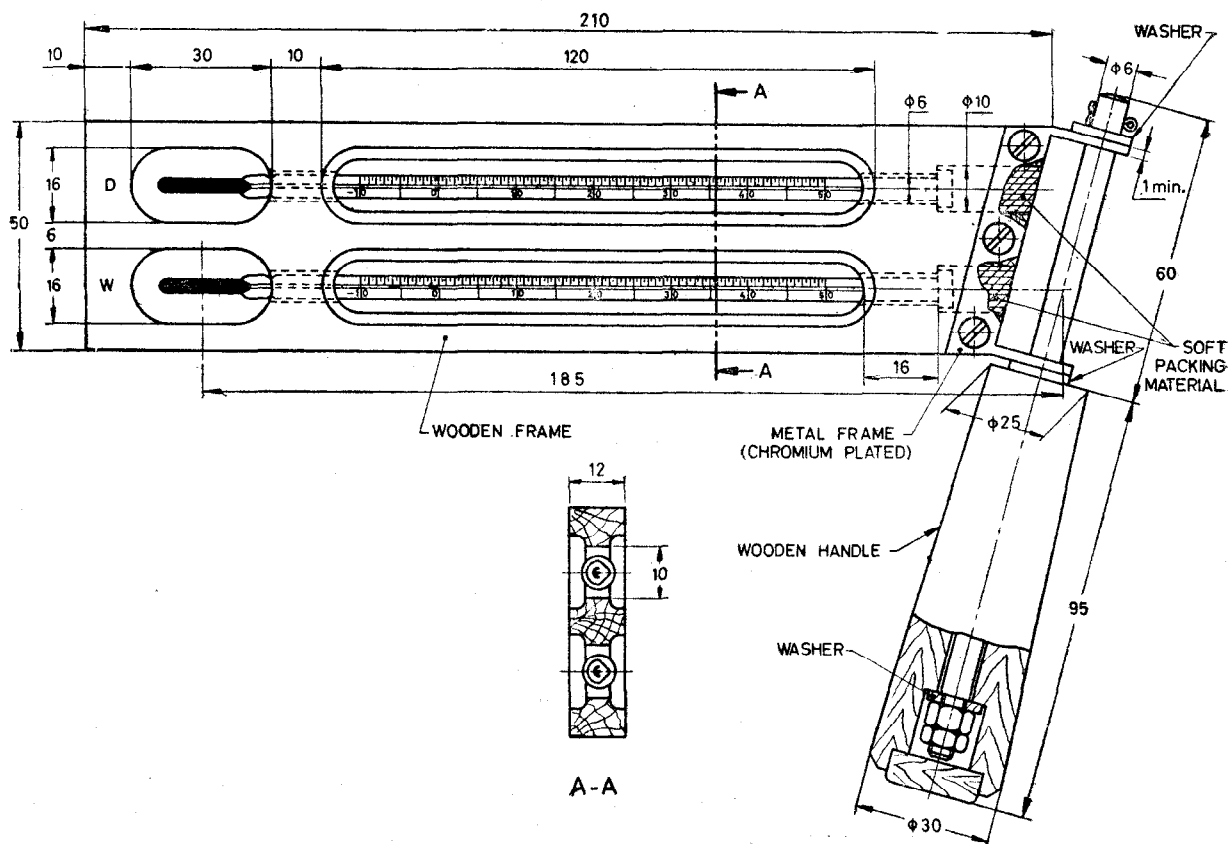
7.3 At least five percent pieces of the lot shall be tested for conformity to all the requirements laid down in 4.5 and 6.

8 MARKING

8.1 The psychrometer shall be marked on the frame with the serial number, year of manufacture, and manufacturer's name initials or trade-mark.

9 PACKING

9.1 The complete psychrometer shall be wrapped in a thin corrugated paper, and packed in a suitable cardboard carton or as agreed to between the purchaser and the supplier.



Letters 'D' and 'W' are to be engraved and filled in Black Colour.

All dimensions in millimetres.

FIG. 1 DIMENSIONS OF WHIRLING PSYCHROMETER

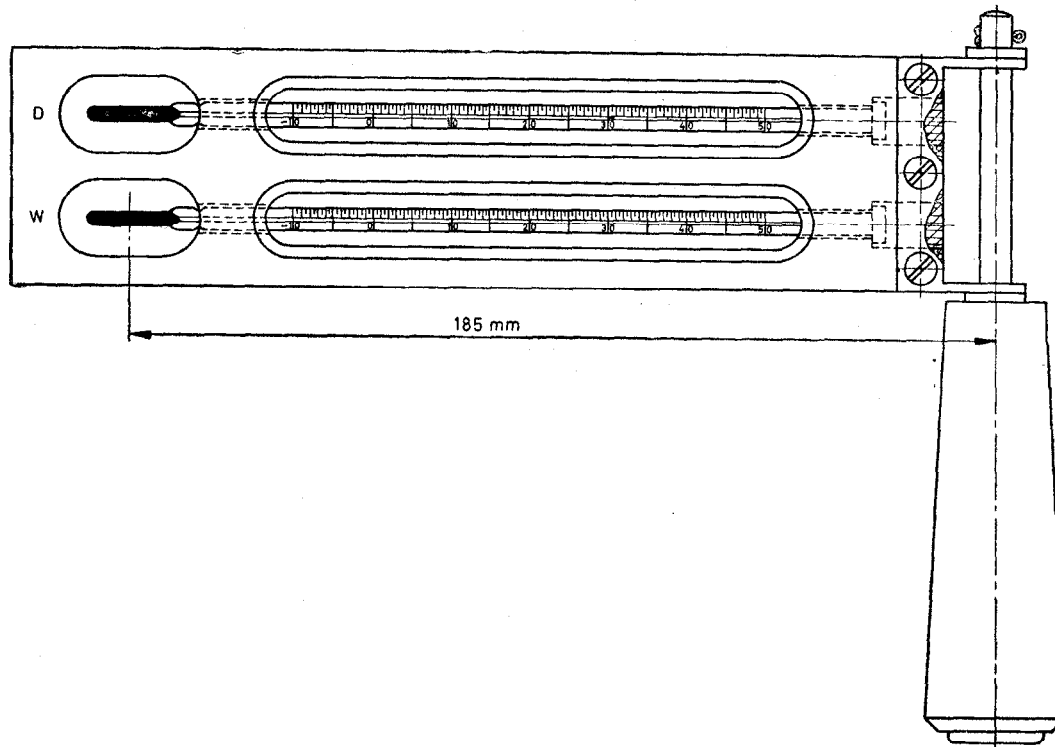
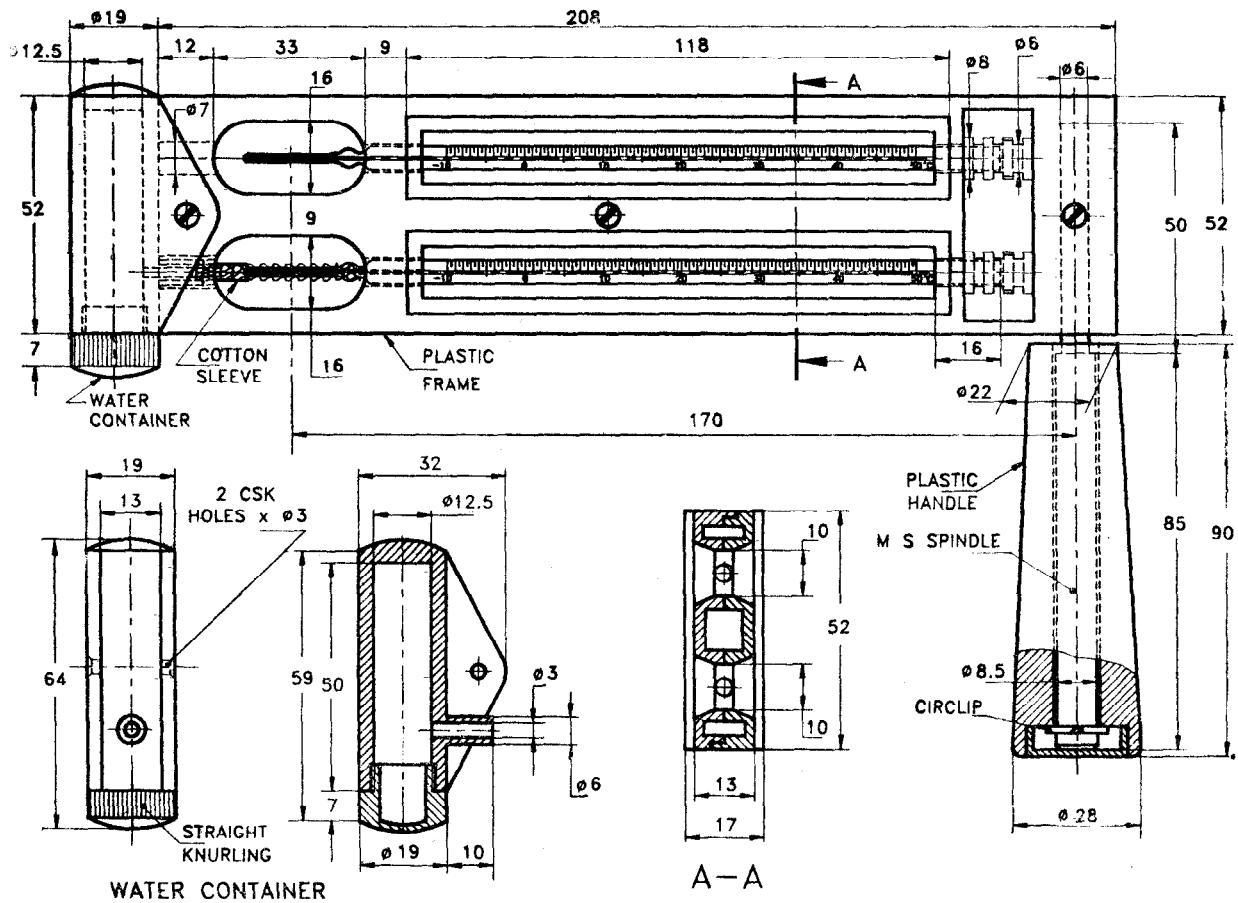


FIG. 2 DIMENSIONS OF WHIRLING PSYCHROMETER WITH HANDLE FIXED AT RIGHT ANGLE



All dimensions in millimetres.

FIG. 3 DIMENSIONS OF WHIRLING PSYCHROMETER WITH PLASTIC FRAME FIXED AT RIGHT ANGLE

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc : No. LM 21 (0061)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

Telephone

{ 331 01 31
{ 331 13 75

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola
CALCUTTA 700054

{ 37 84 99, 37 85 61
{ 37 86 26, 37 86 62

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036

{ 53 38 43, 53 16 40
{ 53 23 84

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093

{ 632 92 95, 632 78 58
{ 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE.
FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR.
LUCKNOW. PATNA. THIRUVANANTHAPURAM.